

Large declines of the Hooded Vulture *Necrosyrtes monachus* across its African range

DL Ogada^{1,2*} and R Buij³

¹ The Peregrine Fund, 5668 West Flying Hawk Lane, Boise, Idaho 83709, USA

² National Museums of Kenya, Ornithology Section, Box 40658, 00100 Nairobi, Kenya

³ Institute of Environmental Sciences, Leiden University, Einsteinweg 2, 2300 RA Leiden, The Netherlands

* Corresponding author, e-mail: darcyogada@yahoo.com

The Hooded Vulture *Necrosyrtes monachus* is not currently listed on the IUCN Red List of threatened species, yet recent email discussions amongst a group of African raptor experts suggests this species may be in rapid decline. Information was solicited from raptor experts, as well as from published and unpublished reports, bird atlases, and individual sightings. No data was obtained for 8% of countries where the Hooded Vulture occurs and the value of the data obtained for the remaining countries varied widely in quality. Despite the variation in data quality, trends from each African region suggest dramatic population declines (mean 62%; range 45–77%) over the past 40–50 years. Some declines were documented in 20 years or less, indicating declines might be occurring rapidly in some areas. The major threats include poisoning, illegal trade for traditional medicine and bushmeat, and persecution. Based on quantitative rates of declines for each region, a revised population estimate for the species is a maximum of 197 000 individuals. We recommend that the Hooded Vulture is uplisted to Endangered under the IUCN Red List criteria.

Introduction

The Hooded Vulture *Necrosyrtes monachus* is an African endemic that is currently a species of Least Concern based on the 2010 IUCN Red List (BirdLife International 2009). Brown (1971) described the species as one of the commonest, in places the commonest, vulture in Africa. However, recent email discussions among African raptor experts via an online African raptor forum (africanraptors@yahoo.com), as well as recent published and unpublished reports, suggest that the species might require upgrading on the Red List owing to recent population declines particularly in East, West and southern Africa.

The Hooded Vulture occurs throughout much of sub-Saharan Africa with the exception of heavily forested areas in central Africa (Figure 1). It is scarce in southern Africa with concentrations in the Okavango Delta, Hwange and regions along the Zambezi River, Zimbabwe and Kruger National Park (Mundy 1997). It is a migrant in Djibouti and Swaziland and a vagrant in Morocco (African Bird Club and Dowsett 2007–2010).

The Hooded Vulture is a versatile scavenger that occupies a variety of habitats including deserts, forests, savanna and urban areas. North of the equator it is a human commensal that is often associated with rubbish dumps and slaughterhouses in urban areas where it can gather in large numbers. This close relationship with man has enabled it to increase in numbers as it lacks competition from other vultures in urban environments (Anderson 1999). However, its close association with man has resulted in its overexploitation for food and traditional medicines predominantly in West Africa (Anderson 1999, Sodeinde and Soewu 1999).

South of the equator the Hooded Vulture is more solitary and is largely found in conservation areas where it relies on natural food for most of its diet (Anderson 1999). Throughout its range it feeds on scraps, offal, faeces, carcass remnants, and sometimes on insects (Zimmerman et al. 1996). The Hooded Vulture is sedentary, it nests and roosts on trees, and it can occur in more forested areas than any of the other African vultures.

The current classification of the Hooded Vulture as a species of Least Concern is based on its extremely large range, apparently stable population trend and its very large population size, estimated at 200 000–330 000 individuals (Anderson 1999, BirdLife International 2009).

In 2009 a Raptor 'Black List' for Africa was established that represents an important first step towards attaining a fully fledged, consensual and credible Regional Red List. This 'species to watch' list includes species that cannot endure the longer process of accumulating sufficient data for a proper Regional Red List assessment and may require immediate attention. Crucially, such species may fail to be red-flagged by the global Red List. Under this regional 'Black List', the Hooded Vulture was assessed as Near Threatened in West Africa and Vulnerable in southern Africa. It was not listed for Central and East Africa (Githiru et al. 2009).

Material and methods

Data on trends of Hooded Vulture populations across Africa was solicited informally through an online forum specific to African raptors. Although the forum is open to anyone with

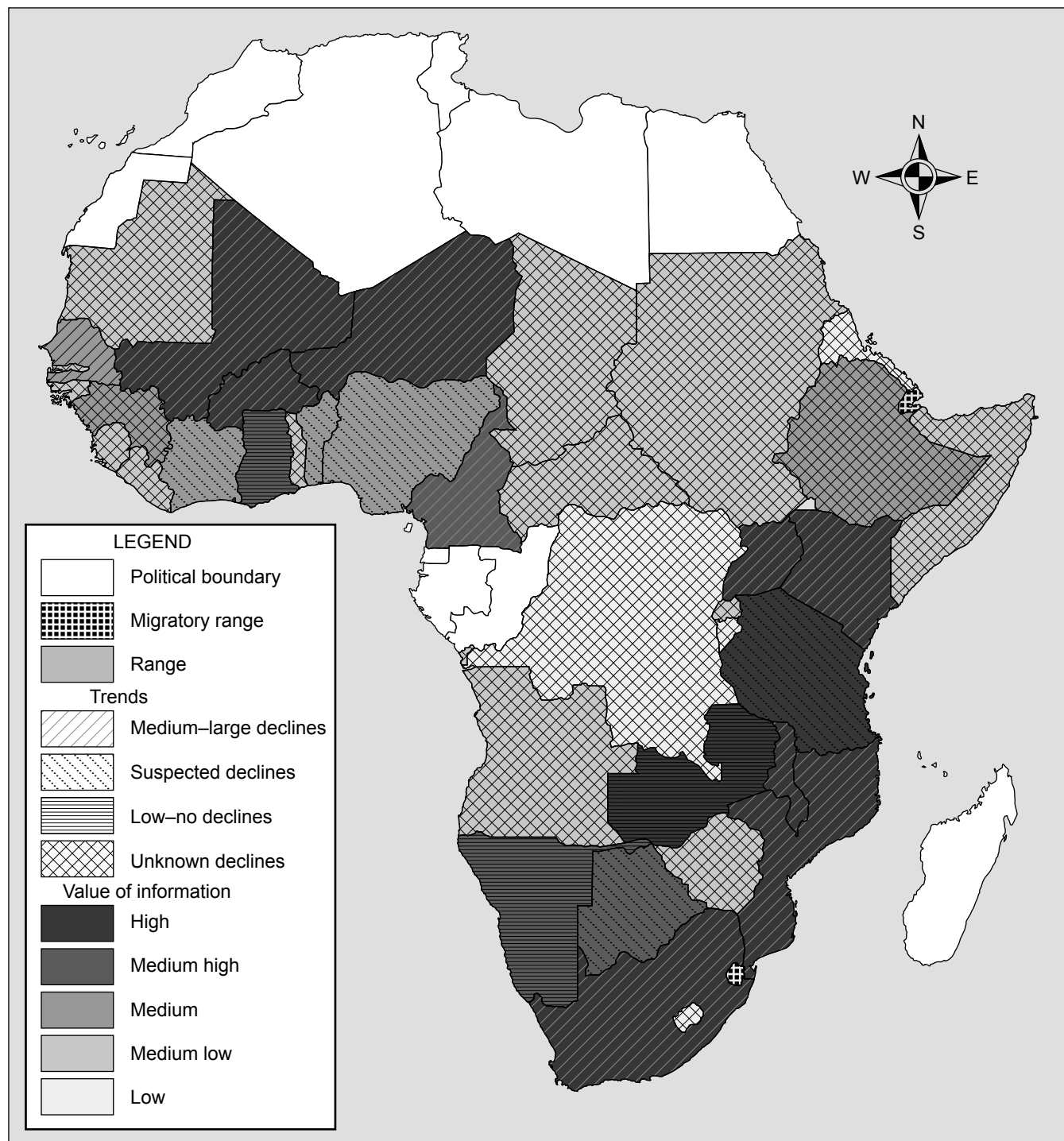


Figure 1: Hooded Vulture range, population trends and value of information from range countries

an interest in African raptors, respondents tend to be those with many years of field experience studying raptors and most have published widely in both regional and international scientific journals. In addition, a literature search was conducted for published papers and reports.

The value of the information gathered varied considerably from country to country. Quantifying changes in population size can take the form of: (1) raptor road

counts several years apart, (2) specific population monitoring, (3) changes in reporting or occupancy rates from atlas mapping and (4) presence/absence data for specific locations. The following description is of the relative value of the information obtained and progresses from the most to the least valuable. In countries that had a range of information available (Kenya, South Africa and Uganda), we reported only the most valuable information

that showed population trends over long periods. Scientific papers published in the last decade and that showed country-wide population trends specific for the Hooded Vulture were the most valuable (Burkina Faso, Mali, Niger and Uganda). Information from long-term bird atlas projects with large datasets (Malawi, Tanzania, South Africa and Zambia) and unpublished trend data for large areas of the country (Kenya) was also highly valuable. Recent scientific papers that showed declines in specific areas of the country or habitats (Botswana, Cameroon and Kenya) were also valuable. Unpublished reports and data that were comparable to survey data undertaken in the 1960s and 1970s (Cameroon and Uganda) were similarly very useful. Information from published papers that did not contain trend information, but that contained country-wide population estimates (Mozambique and Namibia) was useful. Unpublished reports were generally from raptor surveys undertaken within the past decade and have not yet been repeated (Ethiopia, Guinea and Tanzania) or from multiple surveys in a protected area (Benin and Nigeria). Recent population estimates based on occupancy rates in country-wide atlas data (Ghana) and population estimates from published reports from particular regions of the country made prior to 2000 (Chad, Lesotho and Sudan) were moderately useful. Data from bird atlas projects with small datasets (Rwanda and Niger) and country-wide presence/absence data (Angola and Zimbabwe) were also moderately useful. Published checklists from particular areas of a country (Central African Republic, Guinea, Guinea-Bissau, Ivory Coast, Mauritania, Sierra Leone, Sudan and Togo) and individual sightings (The Gambia, Liberia and Somalia) were used to show distributions or presence/absence data for specific locations.

Qualitative data included expert opinion surveys from individuals working in specific countries (Burkina Faso, Cameroon, Ghana, Ivory Coast, Senegal and Tanzania).

Also included were threats to vultures where published papers or other information was available (Botswana, Burkina Faso, Cameroon, Ethiopia, Ivory Coast, Kenya, Lesotho, Mozambique, Namibia, Nigeria, Senegal, South Africa, Tanzania and Zimbabwe).

Results

A total of 35 individuals emailed information about the status of Hooded Vultures in 22 countries. For three countries we were unable to obtain any information or sightings apart from the vulture appearing as a resident on the country's checklist (Table 1). These countries are mostly characterised as countries experiencing recent civil wars (Figure 1).

West Africa

Benin

Pendjari National Park in neighbouring Burkina Faso was included in the survey by Thiollay (2007a) where he estimated declines for Hooded Vultures of 31% in protected areas, though he mentioned that the largest and least disturbed part of the park was in Benin, so this may be an overestimate for this region. Green and Sayer

(1979) reported that the Hooded Vulture was a common, year-round resident in Pendjari National Park. F Lemaire and B Dowsett visited Parc W and Pendjari National Park in February 2010 and reported that Hooded Vultures were widespread in small numbers in both parks, and there was a roost of several dozen in woodland near the hotel in Pendjari (F Lemaire and B Dowsett pers. comm.).

Claffey (1995) reported that the birds were frequently seen year-round in riparian areas in the Bétérou area. F Lemaire and B Dowsett (pers. comm.) visited the Bétérou area in February 2009 where they found a dozen birds near the village of Ouari Maro, including a pair at a nest in a *Ceiba* sp.

F Lemaire, B Dowsett, and S and J Merz (pers. comm.) reported Hooded Vultures near Cobli (on the road to Tanguiéta from the Togo border), at Tanguiéta, and at Natitingou. They did not report any birds in the south of the country, though records from neighbouring Togo suggest they should be present there.

Burkina Faso

Hooded Vultures (together with Black Kites) are more commonly and permanently associated with human settlements and refuse than with natural savannas and food resources (carcasses). They are usually the species most positively associated with densely inhabited areas (Thiollay 2006b). Hooded Vultures were significantly more abundant in cultivated and peripheral areas than in protected areas (Thiollay 2007b). Though not significant, Thiollay (2006b) reported a 30% decline in the occurrence of Hooded Vultures and Black Kites in natural savanna areas from surveys conducted in 1972 and resurveyed in 2002. He noted that vultures may be declining through incidental poisonings targeting jackals and hyenas, and indiscriminate use of pesticides, rodenticides and veterinary medicines (Thiollay 2006b).

The Hooded Vulture remains numerous in central Burkina Faso, but has declined dramatically in the southwest, almost disappearing from Bobodioulasso where hundreds were seen 30 years ago. There were reports of the slaughter of Hooded Vultures for food and there is a trade in smoked vulture meat from Niger to Nigeria. The use of vultures for traditional medicines and sorcery is common and it is routine to see their body parts on sale at markets (Thiollay 2006a).

According to P Weesie (pers. comm.): 'I first visited Ouagadougou in 1983 when there were thousands of Hooded Vultures there, which remained the case until approximately 2005. On every street corner, especially near markets, there were several tens. Also tens of nests were in a large forest in the city. Near the abattoir there were always 100 or more individuals. The past few years things have changed for the worst and Hooded Vultures have greatly declined in Ouagadougou. The reason is unknown. In March 2010 there were still approximately 10 birds at a regular site near the market where I used to visit. In November 2010 none were seen. In Koudougou meat of Hooded Vultures is apparently sold mixed with chicken meat, but this has not been confirmed. In the villages in the south Hooded Vultures are apparently still fairly common according to reports received from local researchers.'

Table 1: Sources of information for the 37 countries where Hooded Vultures are resident

| Country | Country checklist ¹ | Published report | Unpublished report or trend data | Recent sightings ² | Expert opinion | References for papers, reports and unpublished data |
|------------------------------|--------------------------------|------------------|----------------------------------|-------------------------------|----------------|---|
| Angola | X | X | | | | Dean (2001) |
| Benin | X | X | | X | | Green and Sayer (1979), Claffey (1995), Thiollay (2007a) |
| Botswana | X | X | X | | | Herremans and Herremans-Tonnoeyr (2000), Borello (2004), BirdLife Botswana (2008), Hancock (2009, 2010) |
| Burkina Faso | X | X | | X | X | Thiollay (2006a, 2006b, 2007b) |
| Burundi | X | | | | | |
| Cameroon | X | X | X | X | X | Thiollay (2001), RB (unpublished data) |
| Central African Republic | X | X | | | | Carroll (1988), Bretagnolle (1993) |
| Chad | X | X | | | | Scholte (1998) |
| Democratic Republic of Congo | X | | | | | |
| Eritrea | X | | | | | |
| Ethiopia | X | | X | X | | Dellelegn and Abdu (2010) |
| The Gambia | X | | | X | | |
| Ghana | X | X | X | X | X | Mundy (2000), Lemaire and Dowsett (unpublished data) |
| Guinea | X | X | X | | | Richards (1982), Walsh (1987), Halleux (1994), Rondeau et al. (2008) |
| Guinea-Bissau | X | X | | | | Hazevoet (1996) |
| Ivory Coast | X | X | X | X | X | Demey and Fishpool (1991), JM Thiollay (pers. comm. in Mundy et al. 1992), Salewski (2000), Rainey and Lachenaud (2002), JM Thiollay (pers. obs. in Thiollay 2006a) |
| Kenya | X | X | X | X | | Zimmerman et al. (1996), Ogada and Keesing (2010), Ogada et al. (2010), Virani et al. (2011), D Fisher (unpublished data) |
| Lesotho | X | X | | | | Maphisa (2001), Vogeley (2004) |
| Liberia | X | | | X | | |
| Malawi | X | X | | | | Long (1960), Dowsett-Lemaire and Dowsett (2006) |
| Mali | X | X | | X | | Thiollay (2006a) |
| Mauritania | X | X | | | | Gee (1984) |
| Mozambique | X | X | | X | | Clancy (1971), Parker (1999, 2004) |
| Namibia | X | X | | | | Bridgeford (2004), Simmons and Brown (in press) |
| Niger | X | X | X | X | | Giraudoux et al. (1988), Thiollay (2006a), Niger Bird DataBase via J Brouwer |
| Nigeria | X | X | X | | | Crick and Marshall (1981), Sodeinde and Soewu (1999), Nikolaus (2001), Rondeau and Thiollay (2004), T Talatu (unpublished report) |
| Rwanda | X | | | X | | |
| Senegal | X | X | | X | X | Rodwell et al. (1996) |
| Sierra Leone | X | X | | X | | Harding and Harding (1982), Harkrider (1993) |
| Somalia | X | | | X | | |
| South Africa | X | X | X | X | | Boshoff et al. (1983), Brooke (1984), Tarboton and Allan (1984), Mundy (1997), South African Bird Database Project 2 via D Harebottle, Barnes (2000) |
| Sudan | X | X | | X | | Wilson (1982) |
| Tanzania | X | | X | X | X | Tanzanian Bird Atlas via N Baker, Njilima et al. (unpublished report), M Virani (unpublished data) |
| Togo | X | X | | X | | Browne (1980), Cheke and Walsh (1980) |
| Uganda | X | X | X | X | | Ssemmanda and Pomeroy (2010), Pomeroy (2010), D Pomeroy (unpublished data) |
| Zambia | X | X | | | | Dowsett et al. (2008) |
| Zimbabwe | X | X | | | | Hartley et al. (1996), Mundy (1997) |

^a All country checklists were from the African Bird Club and Dowsett (2007–2010)

^b Recent sighting data was obtained from: Benin – B Dowsett, F Lemaire, J and S Merz; Burkina Faso – P Weesie; Ethiopia – M Ogada; The Gambia – www.worldbirds.org; Ghana – F Lemaire and B Dowsett; Ivory Coast – B Ahon; Kenya – W Bol, K Kara, J Karanja, C Kariuki, C Kendall, JK Ndung'u, D Ogada, F Reid, M Virani; Liberia – T Ewert; Mali – M Crickmore, B Dowsett, F Lemaire; Mozambique – M Wilson; Niger – M Crickmore; Rwanda – Rwanda Bird Atlas via M Claassen; Senegal – W Mullié; Sierra Leone – T Ewert; Somalia (Somaliland) – C Cohen; South Africa – A Botha, C Murn; Sudan – F Grossman; Tanzania – J Wolstencroft; Togo – F Lemaire and B Dowsett; Uganda – P Usher

The Gambia

In December 2009 sightings were recorded at Kombo Beach Hotel, Kombo North; Senegambia Hotel, Kololi; Marakissa and Cammalo area (<http://www.worldbirds.org/v3/westafrica.php?c=9>). There is insufficient information to establish a population trend.

Ghana

F Lemaire and B Dowsett, who have been working in the country since 2004, report that it is one of the commonest raptors in Ghana, and the commonest in towns within the rain forest zone. It is both an abundant commensal species and a common raptor in game reserves (Mole). There are two populations: one throughout the forest zone and forest/transition zone in the south-centre where it is very common; and smaller numbers in the far north, from Mole to the Burkina Faso border, including Bawku in the north-east and the Black Volta in the north-west; even in the north it is mostly commensal. Altogether it occurs in 59 of 93 atlas squares, i.e. in 63% of the country and there is no reason to suppose that it has decreased anywhere (F Lemaire and B Dowsett unpublished data).

Mundy (2000) reported a 'cloud' of 500 birds near the slaughterhouse and meat market at Kumasi in 1996. There were also dozens of birds at the old slaughterhouse in Accra (Mundy 2000).

Guinea

Rondeau et al. (2008) reported that healthy vulture populations were still present in the country. In their recent nationwide survey, Hooded Vultures were the most commonly occurring raptor. All Hooded Vultures were found in towns and rural areas; none were observed in protected areas (Rondeau et al. 2008). However, there are no previous baseline surveys with which to draw comparisons. Halleux (1994) reported them as common in the eastern part of the country. Walsh (1987) reported them as common in larger settlements from Siguiri to Beyla. Richards (1982) reported them as very common in Conakry City.

Guinea-Bissau

In coastal regions Hooded Vultures were reported as common at Bisseau, Ilha de Bolhama, Ilha de Bubaque, Ilha de Rubane and north-east of Safin in 1986 (Hazevoet 1996). There are no comparable recent surveys.

Ivory Coast

Eating Hooded Vultures has resulted in local extinctions (JM Thiollay pers. obs. in Thiollay 2006a) and the species has greatly declined in the north of the country as a result of hunting pressure (JM Thiollay pers. obs. in Mundy et al. 1992). Demey and Fishpool (1991) stated that it remains common in at least some of the towns (Agnibilekrou and Abengourou) in the east of the country near the border with Ghana. B Ahon (pers. comm.) further confirmed that there is a small population (30 individuals) in the south-east of the country on the border with Ghana near the coast. Salewski (2000) recorded them as frequently seen resident breeders in Comoé National Park. Rainey and Lachenaud (2002) reported them as frequent around Aboisso.

Liberia

During the past four years (2006–2010), no Hooded Vultures were observed in Monrovia (T Ewert pers. comm.). There is insufficient data to establish any trend.

Mali

Thiollay (2006a) reported that Hooded Vultures declined dramatically in Mali, almost disappearing from Segou and Mopti where hundreds were seen 30 years ago. The vulture once thrived in every town and village but was surprisingly scarce throughout large sections of the country (Thiollay 2006a).

There have been no sightings of Hooded Vultures in Bamako or Sokolo since 2003 and 1998, respectively. The most recent sightings include six individuals seen in 2003 in Bandiagara (Dogon area) and two seen between Gao and Douentza in 2004 (M Crickmore pers. comm.). Despite spending 11 weeks in the country (6 weeks in 2002 and 5 weeks in 2004), F Lemaire and B Dowsett (pers. comm.) did not see any Hooded Vultures in the south, nor during a few days spent in the Sahel, near Mopti, and in the Gourma (north of Douentza) and as far east as Gao.

Mauritania

Gee (1984) recorded Hooded Vultures in the south-west near the Senegal River and noted that they do not move far north of the river even during the rains. There are no comparable recent surveys.

Niger

Thiollay (2006a) reported that Hooded Vultures declined dramatically in Niger, almost disappearing from towns such as Niamey where hundreds were seen 30 years ago. The vulture once thrived in every town and village but was surprisingly scarce throughout large sections of the country (Thiollay 2006a). Large numbers used to migrate in the rainy season up to the southern Aïr Mountains and then back to the south from November onwards (Thiollay 1977).

Although there is significant variation in observer effort in time and space, data from the Niger Bird DataBase suggests a reduction in numbers. During 1990–1998, 10% of observations of Hooded Vultures were of 10 or more individuals, compared to only 5% of observations during 2002–2008. Further, the average number of Hooded Vultures per observation was 4.9 during 1990–1998, compared to 3.5 vultures per observation during 2002–2008 (Niger Bird DataBase, <http://www.bromus.net/nibdab>).

Giraudoux et al. (1988) noted it was common year-round in the south and south-west of the country, particularly in Parc W and along the Niger River.

Nigeria

In their report on the avifauna of Yankari Game Reserve, Crick and Marshall (1981) state that the Hooded Vulture was common throughout the reserve in all months and had been recorded breeding during the month of January. T Talatu (unpublished report) recorded only one individual during 10 survey months in 2007 in the game reserve. However, Talatu added that there was previously a camp with >700 individuals within the reserve and its removal may account for the drop in numbers of Hooded Vultures.

She also reported that vultures were hunted in large quantities in the early 1980s for 'commercial purposes' and people have been arrested with a sack of vultures to be roasted for food. She further speculates that human consumption of vultures may be one of the reasons for their decline (T Talatu unpublished report). Hooded Vultures were frequently seen in the Lake Chad Basin of north-eastern Nigeria in 1997–2000 (Gustafsson et al. 2003).

A study of the traditional medicine trade in Nigeria by Sodeinde and Soewu (1999) showed the Hooded Vulture was the most frequently traded bird and was offered by 36% of all traders surveyed ($n = 64$) in five south-western towns. The head is used to protect against witches and the whole body may be used for good fortune (Sodeinde and Soewu 1999). Another study of the fetish trade in Nigeria indicated that Hooded Vultures were the most common vulture on sale. Although their availability in the markets may likely be more indicative of their abundance in the region compared to large vultures, which were more in demand but difficult to obtain (Nikolaus 2001).

The Hooded Vulture is also eaten for food by numerous communities and the birds have practically disappeared from numerous towns and villages where they were formerly abundant (Anon. 1997, V Nnanna pers. comm. in Rondeau and Thiollay 2004).

Senegal

A raptor researcher in Senegal reported: 'My personal impression is that both Hooded and African White-backed have declined over the past 20 years, both of which are more strongly associated with human habitations. There is still a small population of Hoodeds in urban Dakar, which seems to be much smaller than it was 15–20 years ago. In the past I rarely saw more than 10–15% hooded on fresh carcasses, this seems to be down to <5–10%, but occasionally good numbers of all vulture species are seen in central Senegal, so declines and shifts in community structure may differ regionally' (W Mullie pers. comm.). The species was recorded as 'rare' in Parc National des Oiseaux du Djoudj as it was only recorded three times during 25 expeditions over a 10-year survey period (Rodwell et al. 1996).

Sierra Leone

Harding and Harding (1982) reported Hooded Vultures were frequently sighted in riparian areas in the Kilimi area in the north-west of the country. The birds were common in farm-bush habitat on the campus of Njala University College (Harkrider 1993). During January–March 2007, F Lemaire and B Dowsett (pers. comm.) visited Gola Forest for six weeks and reported Hooded Vultures to be common as a commensal species, including the town of Kenema where several were seen during multiple visits, and Bo, which was crossed enroute. T Ewert (pers. comm.) reported that there is still a population in Freetown as well as in some of the regional capitals.

Togo

It was recorded as a 'commoner' species by Cheke and Walsh (1980). Browne (1980) did not mention any Hooded Vulture sightings from Lome. F Lemaire and B Dowsett

(pers. comm.) spent a few days crossing the country twice in late February 2010. They did not see any in 2 d spent in Kéran National Park in the north, a park that is virtually empty of game. While driving south from Kara they recorded Hooded Vultures at Soutouboua and in the Kpalimé/Klouto area where they spent 3 d. They noted that it could be common on the Ghana border, as it is common on the Ghana side, between 8°30 and 6° N (F Lemaire and B Dowsett pers. comm.).

Central Africa

Cameroon

Thiollay (2001) recorded a 67% decline in the mostly urban Hooded Vulture in northern Cameroon from road surveys originally conducted in 1973 and resurveyed in 2000. He reported a much lower number of Hooded Vultures during stops in towns and villages, often by an order of magnitude. Food availability alone could not explain why Hooded Vultures virtually vanished from towns (Thiollay 2001).

Recent road survey data (2006–2009) from the three northern provinces (RB unpublished data) suggests that when compared to Thiollay's 1973 data, Hooded Vulture declines were similar to the declines reported in Thiollay (2001), suggesting that Hooded Vulture populations in northern Cameroon weren't any worse off during 2006–2009 than they were in 2000.

During the past decade, the trade in vulture heads for witchcraft and sorcery that stems from Nigeria has probably had the biggest effect on declining vulture populations, and more recently on Hooded Vultures (RB pers. comm.). In November 2010 two dealers were found with 12 heads and several feet of Hooded Vultures in the city of Maroua. They were selling the heads at €3,80 (US\$5). In December 2010, one dealer had a total of 10–12 heads of Hooded Vultures on sale in the city of Garoua (B Mohamadou pers. comm.). A total of 4–5 dealers in vulture parts were present. A set of one head and two legs were selling at €23–31 (US\$30–40). Buyers would use the parts for traditional medicine. The dealers in Maroua apparently did not have regular customers, once or twice per year a buyer would show up; the demand was higher (unclear to what degree) in Garoua. Heads and meat would often decompose before a buyer would arrive, although they were dried and stored in plastic bags. The dealers in Maroua would not present information on the suppliers or how they obtained the Hooded Vultures, but stated that some vultures were picked up dead in the streets of Maroua, especially during the wet season (RB pers. comm.). Dealers in Garoua stated that vultures were killed using WormForce, a product containing carbofuran (3%) and produced in Nigeria. This product is sold locally in small bags at €0.40 (US\$0.52) a piece. Nigerians in Cameroon state that Hooded Vultures are served as chickens in some Nigerian restaurants (RB *in litt.* 2010).

Central African Republic

Carroll (1988) reported Hooded Vultures were common resident breeders in the Bamingui area and in the Manovo-Gounda-St Floris and Bamingui and Bangoran national parks. Bregtagnolle (1993) reported that Hooded Vultures were common resident breeders in the Vakaga Prefecture. There are no comparable recent surveys.

Chad

Scholte (1998) recorded Hooded Vultures as the most widespread and probably the most common vulture in the Lake Chad Basin. Sightings were confined to human settlements, e.g. in towns and camps of nomadic pastoralists. Populations were estimated for the Lake Chad Basin, which includes a large section of Niger and smaller sections of Nigeria, Cameroon and the Central African Republic, of at least 20 000 birds (Scholte 1998).

Democratic Republic of Congo

No information was obtained.

East Africa**Burundi**

No information was obtained.

Eritrea

No information was obtained.

Ethiopia

The first raptor road surveys were undertaken in February 2010 within a 200 km radius of Addis Ababa. Hooded Vultures were seen on all of the 18 routes except one and on average there were 32 individuals per 100 km over 1 117 km. They were almost always associated with towns and villages (Dellelegn and Abdu 2010).

Kenya

The Hooded Vulture is a species that has been and continues to be in steep decline in Kenya. It was previously widespread in most national parks, game reserves and towns (Zimmerman et al. 1996). Nationwide raptor surveys in February 2010 and 2011 did not record a single Hooded Vulture over 2 259 km despite surveying suitable habitat (Ogada et al. 2010, DLO unpublished data). Annual data from three-week nationwide bird tours have shown that the number of days Hooded Vultures were seen declined by 40% from 1989–1999 to 2000–2010. Even more striking, the maximum daily count declined by 73% during the same time periods (D Fisher unpublished data). However, a recent expedition to northern Kenya recorded pairs of Hooded Vultures at most small settlements that were slaughtering camels around the Chalbi Desert (F Reid pers. comm.).

Virani et al. (2011) reported Hooded Vulture declines of 62% in and around the Masai Mara National Reserve from 1976 to 2005. There was a shift in distribution with Hooded Vultures previously using more degraded areas far from the reserve as well as Masai Mara National Reserve itself during the early surveys, but then shifting to primarily within the reserve in the recent surveys (Virani et al. 2011).

In Laikipia District in central Kenya, current data show the species represents 1% of vultures at carcasses ($n = 1\ 631$ vulture observations; DLO unpublished data). Carcass counts at Amboseli National Park ($n = 1\ 291$) and Queen Elizabeth National Park, Uganda, indicate Hooded Vultures made up 10% of vulture species at carcasses in similar savanna habitat (Anderson and Horwitz 1979, Petrides 1959). The species was not recorded during three years of raptor surveys in 2001–2003 (Ogada and Keesing 2010). [Wright \(1960\)](#) described the Hooded Vulture as

the most common vulture in Nairobi, Tsavo and Serengeti National Parks.

Since 2007 there have been 366 vultures in Kenya killed by poisoning (J Clark unpublished data). This number is most likely an underestimate of the actual total. Poisoning of wildlife remains the biggest threat to vultures in Kenya (D Ogada 2010).

Rwanda

Recent reports indicate Hooded Vultures are likely present throughout the year and can be found in Ruhengeri and Kinigi (M Claassen, Rwanda Bird Atlas). There is insufficient information to establish a population trend.

Somalia

A birding tour to Somaliland in 2010 recorded two Hooded Vultures near Burco Town, though Egyptian Vultures were common in the northern towns (C Cohen pers. comm.). There is insufficient information to establish a population trend.

Sudan

Wilson (1982) wrote that all species appear to have undergone a drastic reduction in numbers throughout most of Darfur. He further noted that no vultures were ever present at the Zalingei slaughterhouse throughout late 1976 and the whole of 1977, nor were any seen during the several weekly village slaughtering (Wilson 1982).

F Grossman (pers. comm.) recently reported Hooded Vultures as being very common in Juba.

Tanzania

According to N Baker (pers. comm.) this bird is doing far better inside protected areas but there are nearly 200 000 km² of these. It has never been common in the northern Rift Valley. It's not a dry country species. It has never been a city bird apart from a few in Bukoba and a few around Pugu Station south-west of Dar es Salaam where the cattle (always a few dead ones) are off-loaded from the trains. A population estimate from the Tanzanian Bird Atlas Project is 10 000–15 000 birds based on 1 857 records (N Baker pers. comm.).

Raptor surveys conducted in February 2010 covered 1 481 km to the south and north-west of Arusha and recorded seven individuals, or 0.5 individuals per 100 km, all in grassland protected areas, none in settlements or agricultural areas (Njilima et al. 2010). In some protected areas (e.g. Maswa Game Reserve) and unprotected areas human persecution of vultures has been increasing in recent years. Vultures are being killed for their body parts for ingredients of superstitious traditional cures (Njilima et al. 2010).

Raptor surveys conducted in February 2008 in northern Tanzania covered 1 328 km east of Arusha (76 km in protected areas vs 1 252 km in unprotected areas) where no Hooded Vultures were seen. Surveys covered 1 123 km west of Arusha (708 km in protected areas vs 415 km in unprotected areas) where 10 Hooded Vultures were seen in protected areas and 11 in unprotected areas. In all, 0.4 individuals per 100 km were seen (M Virani unpublished data).

They appear to have become increasingly restricted to the larger protected areas and are rarely seen anywhere east of Mto wa Mbu, which is in the Rift Valley just east

of Ngorongoro Crater and the Serengeti protected areas (J Wolstencroft pers. comm.).

Uganda

Annual raptor surveys from 2007–2010 show large declines (78%) of Hooded Vultures compared to similar road surveys conducted by Leslie Brown in 1967–1968 (D Pomeroy unpublished data). Hooded Vulture numbers in Kampala increased steadily from 1973–2005, but suffered a 38% decline from 2005 to 2009, which has been attributed to habitat modifications caused by construction (Ssemmanda and Pomeroy 2010) and recent improvements in abattoir hygiene and rubbish disposal (D Pomeroy pers. comm.).

Nationwide raptor surveys conducted in February 2010 showed an average of 3.9 individuals per 100 km (D Pomeroy 2010).

Southern Africa

Angola

It occurs on the western coast, but it is likely more common and certainly underreported. There are no breeding records (Dean 2001). There is insufficient information to establish a population trend.

Botswana

The Hooded Vulture is listed as a species of Conservation Concern, which means it is 'potentially or actually threatened based on our current state of knowledge. Some of these species are recognised as being globally threatened, but others have undergone declines within the Southern African region and may be under threat in Botswana' (BirdLife Botswana 2008).

Its distribution in Botswana is limited to the northern part of the country that is largely protected in the form of parks, reserves and management areas. The species was not recorded in any road counts in 2008 despite driving through suitable habitat (BirdLife Botswana 2008). Only five breeding records have been recorded, the most recent in 1994, despite the bird being plentiful in the north (Borello 2004).

Recently, intentional poisoning of vultures has been occurring where poachers target vultures because they expose the location of their activities when they arrive to feed on the carcass. Several incidents have occurred in wildlife management areas adjacent to the Okavango Delta, including the Okavango Delta Important Bird Area. Eighty-five vultures, including Hooded Vultures, are known to have been killed in three separate incidents (Hancock 2009, 2010).

Herremans and Herremans-Tonnoeyr (2000) conducted road surveys from 1991–1995 over 55 577 km and found that Hooded Vultures in Botswana were most abundant at the interface between protected and unprotected areas. Though their numbers were relatively high inside protected areas where they averaged 36.5 birds km⁻¹, <100 km from a protected area boundary they averaged 4 388 km bird⁻¹, and none were seen >100 km from a protected area boundary (Herremans and Herremans-Tonnoeyr 2000).

Lesotho

Hooded Vultures were not recorded during a survey of Quthing District in 2003, where only Bearded and Cape Vultures were recorded (Vogeley 2004). An expedition

in 1998 found that there was considerable persecution of vultures including shooting and especially poisoning (Maphisa 2001). There is insufficient information to establish a population trend.

Malawi

Hooded Vultures are still fairly common in the north and smaller numbers in the south-east (Dowsett-Lemaire and Dowsett 2006), but the species has decreased locally. In the Chiromo area a sharp decline was already noted in the 1950s (Long 1960). It became rare in Lengwe National Park in the 1980s with the last two records in 1995 and 2002. The decline in wild mammal populations and dipping of cattle were mentioned as possible causes for the decline.

Mozambique

There are an estimated 50 breeding pairs and 150 individuals in Mozambique. The bush meat trade is considered the biggest threat owing to unsustainable illegal hunting of mammalian prey species (Parker 2004). It was formerly widespread in southern Mozambique (Clancy 1971), but has become rare and an estimated five pairs occurred in southern Mozambique in the 1990s (Parker 1999). In June 2008 two Hooded Vultures were recorded at Bilibiza in the north of the country (M Wilson pers. comm.).

Namibia

In the Namibia red data book Simmons and Brown (in press) report that: 'The Hooded vulture is considered a Rare and Peripheral species. There are no known breeding records (it may be overlooked) and on raptor road counts in northeast Namibia it was recorded at very low densities of 0.1–1.6 birds/1000 km in 80 674 km of road counts (Jarvis et al. 2001). While it is known to have declined in southern Africa in recent decades probably through poisons (Mundy 1997), it is less likely to have been very abundant in Namibia given its very low reporting rate (1–12%) in the pristine Etosha NP. Current populations are guesstimated at a maximum of 500 birds, representing much less than 1% of the African population, but further research is required.'

Poisoning is the biggest killer of vultures in Namibia, mostly as a result of poisons targeting problem animals such as lions, hyenas and jackals (Bridgeford 2004).

South Africa

According to Mundy (1997): 'The Hooded vulture has undergone a dramatic contraction of range in recent times. Though considered to be rare in South Africa, it is thought to have decreased in the face of persecution and poisoning (Brooke 1984). It no longer occurs anywhere in Cape Province apart from occasional sightings in the Kalahari Gemsbok National Park (Boshoff et al. 1983). There is also evidence that it has decreased to a 'remnant' population in the Transvaal (Tarboton and Allan 1984). Populations estimated for South Africa stand at 50 breeding pairs (Tarboton and Allan 1984). Very few birds have been found poisoned (Mundy et al. 1992), but as a naturally rare and solitary species, poisoned individuals could be easily overlooked.' In the 1990s, the South African breeding population was estimated at 50–100 pairs (Anderson 1990, Barnes and Tarboton 1998), with at least 64 breeding adults

in the Kruger National Park (Kemp et al. 2001). Hooded Vultures are relatively common in private game reserves west of Kruger National Park, but overall breeding density is low with few breeding records (Roche 2006). It is considered vulnerable in South Africa with a recent decrease of c. 10% (Barnes 2000).

Records from the Southern African Bird Atlas Project 2 (2007–present) reveal that the Hooded Vulture may not be as common in the Kruger National Park as it was 20 years ago and that they are becoming more abundant in the private game reserves adjacent to Kruger. Overall, the reporting rate for this species declined in 67% of the atlas grids from where it was recorded during the first atlas from 1987–1991. This is compared to an increase in the reporting rate between the two atlases in only 28% of atlas grids (Harebottle 2010).

Zambia

Hooded Vultures are found almost throughout and are quite common along the major rivers (Dowsett et al. 2008). It is not usually numerous, though larger numbers (6–7) are observed in the big game reserves. It is not known to have suffered significant declines in recent years (Dowsett et al. 2008).

Zimbabwe

It is only common along the Zambezi River where it may be found at hunters' camps and offal dumps. It also occurs in the south-east and in Hwange National Park (Mundy 1997). Over a ten-year period, at least 434 vultures of five species were known to have been poisoned (Hartley et al. 1996).

Data from raptor road surveys

A few countries and regions had data available on the number of Hooded Vultures per 100 km (Table 2) and this shows that the species has declined between 45–77% in three African regions, or an average of 62%.

Population estimate

Based upon a mean of 265 000 birds from the estimate of 200 000–330 000 (Anderson 1999, BirdLife International 2009) it is possible to make an estimate of the current (2010) population by subtracting the estimated percent of decline for each region. However, since any declines had likely already begun by 1999 when this population estimate was first made, it is impossible to know the percent decline since 1999. As an estimate, only 50% of the actual declines estimated from Table 2 were used (Table 3). These suggest that the African population does not exceed 197 000 birds.

Discussion

Accurately assessing the conservation status of a widespread African species will always be problematic owing to the paucity of data available for large regions of the continent (Brooks and Thompson 2001). For the Hooded Vulture there was no information obtained from 8% of countries where the bird is resident. In some of these countries, it is likely there is little information owing to a lack of capacity and institutions supporting ornithological research and conservation. Although original requests for information were made in English, additional requests were conducted in French and Dutch and therefore it is unlikely

that a language barrier was a significant impediment to gathering information.

Assessing a species population status is not without a degree of subjectivity, though we attempted to categorise information as to its value as objectively as possible, a comparison on such a wide scale and with such a range of information requires some individual interpretation of data and to alleviate such subjectivity we tried to be conservative in assessing the scale of declines for countries that had limited data available.

Regional assessments

West Africa (Benin, Burkina Faso, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, The Gambia and Togo)

In West Africa Hooded Vultures are primarily reported in towns and villages where they are typically seen foraging around meat and vegetable markets, and rubbish dumps. However, because they conspicuously gather in towns, their numbers in parks and protected areas, though small, may be underreported.

Data on population trends available for three countries in this region all suggest large declines ($\geq 45\%$) for this species, though the declines were uneven and may not be throughout its entire West African range (Rondeau and Thiollay 2004, Thiollay 2006a). It is also important to note that the population trend data was from the Sahelian and savanna areas and it has been suggested that this may not be reflective of more forested regions (e.g. Ghana) where populations appear to be robust (F Lemaire pers. comm.). However, it is important to note that in countries with long-term trend data, all have reported large declines. Additional data from Nigeria also suggests a decline, especially when combined with the information on the trade in Hooded Vultures for traditional medicine and food. A dealer from Nigeria offered to pay €6 100 (US\$7 880) for four Hooded Vulture eggs in northern Cameroon in 2009 (DLO and RB pers. comm.). Most reports from West Africa mentioned the use of Hooded Vultures for traditional medicine, witchcraft or food, indicating that there is likely widespread capture of this bird for these purposes. They are also relatively easy to capture as they often venture very close to humans at markets and readily accept meat scraps provided to them (RB pers. obs.). Reports indicate there is a significant trade in smoked vulture meat between Niger or Benin and Nigeria (Rondeau and Thiollay 2004). They further speculate that it is quite possible that the disappearance of this species from many towns and villages in West Africa is because of pressure for food.

Central Africa (Central African Republic, Cameroon, Chad and Democratic Republic of Congo)

Though the data is limited, it appears that, as in West Africa, in this region Hooded Vultures show a strong commensalism with humans and are rarely reported outside of towns and villages. They also frequently visit camps of nomadic pastoralists and follow nomadic pastoralists on their annual displacements (Newby 1979). Apart from Cameroon, there is no trend information from this region. Although Scholte (1998) estimated a population of at least 20 000 birds in the Lake Chad Basin, data from

Table 2: The number of Hooded Vultures per 100 km in countries and regions where information is available

| Country/region | Distance surveyed (km) | 1960s to 1980s | 2000s | Percentage change | Reference |
|--|------------------------------|-------------------|------------------|-------------------|------------------------------|
| Ethiopia | 1 117 | | 32.0 | | Dellelegn and Abdu (2010) |
| Kenya | 525 (1970s) 3 400 (2000s) | 4.7 | 1.8 | -62% | Virani et al. (2011) |
| Tanzania | 1 408 | | 0.5 | | Njilima et al. (2010) |
| Uganda | 1 472 | 12.6 ¹ | 2.9 ¹ | -77% | D Pomeroy (unpublished data) |
| West Africa (Niger, Mali, Burkina Faso) | 8 353 | 84.4 | 46.4 | -45% | Thiollay (2006a, 2006b) |
| Guinea | 3 635 | | 33.9 | | Rondeau et al. (2008) |
| Northern Cameroon | 1 359 | 53.0 | 19.4 | -63% | Thiollay (2001) |

¹ Multiplied by a correction factor of 2.38 to account for the 58% fewer raptors observed when sitting inside a vehicle as opposed to observing from a roof hatch (Pomeroy et al. in review)

Table 3: Estimate of the total population size of the Hooded Vulture

| Region | Estimate of proportion of total population (%) ¹ | Estimate of decline (%) ² | Estimate of previous population size | Estimate of current population size |
|---------|---|--------------------------------------|--------------------------------------|-------------------------------------|
| West | 70 | 22.5 | 185 500 | 143 762 |
| Central | 18 | 31.5 | 47 700 | 32 674 |
| East | 10 | 38.5 | 26 500 | 16 297 |
| South | 2 | 25 | 5 300 | 3 975 |
| Total | | | 265 000 | 196 708 |

¹ Estimates were based on actual numbers reported for southern Africa and guesstimates based on numbers per kilometre from road surveys and the number of countries in each region

² Estimates for each region were based on half of those reported in Table 1 and applied region-wide with the assumption that in each region declines in some countries may be higher and in others lower. The estimate for southern Africa was a guess based on the information contained in this report

northern Cameroon (Thiollay 2001, RB unpublished data) suggests large declines (to 67%). Hooded Vultures can still be found in several villages and towns especially in the far north of Cameroon, and in smaller numbers south to the Adamaoua province. They are still fairly common, but gatherings of hundreds are no longer observed. The largest number in one site is 70–80 Hooded Vultures but this is exceptional. In 1996 more than 100 Hooded Vultures died from an unknown cause as some 'literally fell out of the trees' in the town of Maroua (Scholte 1998); now there are only several tens (30–50) in Maroua (R Buij unpublished data). Village chiefs and government officials (regional delegate of Agriculture and Livestock) working in the livestock industry in northern Cameroon remarked that the amount of by-product left for vultures at slaughterhouses has decreased in recent decades. They state that many remains formerly discarded (stomach, lungs, horns, skins, hoofs and blood) are now processed for fertilisers or (animal) food. Hooded Vultures at five slaughterhouses visited in northern Cameroon were competing for scraps with numerous domestic dogs (RB pers. obs.).

East Africa (Burundi, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, Sudan, Tanzania and Uganda)

The Hooded Vulture appears to occupy the greatest range of habitats in this region. It is a well-known human commensal in Uganda, Ethiopia and western Kenya. In Tanzania, it is largely a bird of moist habitats in protected areas away from human habitation. In Kenya, the bird exists

in semidesert areas of the north-west, national parks, and it was formerly abundant in western towns.

The situation in East Africa largely mirrors that of other regions, in that in the two countries with long-term road survey data there have been large declines (mean 70%) for this species. Numbers of Hooded Vultures in Ethiopia appear high, though there is no long-term trend data to draw comparisons.

Southern Africa (Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe) In southern Africa the Hooded Vulture is not a strong commensal with man and it ranges largely in well-developed woodland, mopane, arid woodland and northern Kalahari vegetation in areas that are hot, at low altitude, and semiarid (Mundy 1997). Mundy (1997) suggested that in southern Africa the Hooded Vulture has undergone a dramatic contraction of range in recent times. The population in southern Africa is small and it has been estimated that only about 1 000 individuals (50–100 pairs) occur in South Africa (Anderson 1999, Roche 2006). Poisoning is a major threat to vultures in southern Africa and numerous cases have been recorded in recent years (Verdoorn et al. 2004).

Africa-wide population estimate

There were a number of assumptions made to arrive at a population size of less than 197 000 individuals, but this is the likely upper limit of the population size for this species and represents a decline of 26% over 1999 estimates (Anderson 1999).

Data from raptor road surveys

Recent raptor road survey data shows that, although Hooded Vulture numbers per 100 km are still relatively high in West Africa and Ethiopia, these should be interpreted with caution. Surveys conducted between the 1960s and 1980s indicate that the current populations have declined on average 62% in the last 40–50 years and their abundance is only high relative to the rest of the region.

Implications for conservation

Although there exists a lack of knowledge about Hooded Vulture populations across large areas of the continent, what is clear is that in areas where long-term surveys and record keeping have occurred, dramatic population declines (mean 62%, range 45–77%) have been documented in all areas. This is not to imply that large declines have occurred in all countries as, even in countries reporting large declines, e.g. Burkina Faso, the declines have been uneven. However, this report documents a number of significant negative impacts to Hooded Vulture populations:

- (1) there have been large declines documented across each region in Africa
- (2) though some declines were documented over a span of 40 years, some declines have been documented in 20 years or less, indicating declines may be occurring rapidly in some areas
- (3) there are well-documented threats to vultures, e.g. poisoning, use in witchcraft and traditional medicine, in every African region.

It is important to assess the declines of Hooded Vultures in the context that it is not a habitat specialist and that it is highly adaptable to human activities. In fact, [Mundy et al. \(1992\)](#) noted that because this species is such a close human commensal 'it is in for a quite rosy future'. That it is a generalist scavenger suggests that it may be less prone to extinction as increased habitat specialisation is highly correlated with increased likelihood of extinction and 41% of birds limited to just one habitat type are extinction-prone ([Sekercioglu et al. 2004](#)). That such an adaptable bird is showing widespread declines should be a cause for alarm amongst other more specialised scavengers. Finally, populations that do not live in close association with man (i.e. in southern Africa) are also declining, suggesting that there may be multiple reasons for its decline.

Though the threats facing Hooded Vultures vary in severity across the continent, the main threats to this species include (1) poisoning, (2) illegal trade, either for witchcraft or bushmeat, and (3) persecution – malicious destruction of nests, eggs and young. Climate change may be a threat, particularly in countries bordering the Sahara Desert, as this species is better adapted to wetter climates. However, given the speed and distribution of declines, climate change is an improbable explanation.

Recommendations

It is anticipated that the data gathered in this report will support the up-listing of this species to Endangered. Based on IUCN guidelines, the rate and size of its population decline fit Criterion A, which is defined as: 'A reduction in population size based on any of the following: suspected population size reduction of 50% over the last 10 years

or three generations, whichever is the longer, where the reduction or its causes may not have ceased OR may not be understood OR may not be reversible' (IUCN 2001). Based on the data summarised in this report, declines for this species averaged 62% within the last 20–50 years (mean 32.3 years). Although the generation length for this species is unknown, it is approximately 14.5 years based on comparisons with the slightly smaller Egyptian Vulture *Neophron percnopterus* (generation length 14 years) and the larger White-rumped Vulture *Gyps bengalensis* and Slender-billed Vulture *Gyps tenuirostris* (generation length both 16 years) (BirdLife International 2010). Therefore three generations would equal 43.5 years for this species and the declines observed largely fall within this timeframe.

In terms of reducing the major threats to this species, all of which are directly associated with humans, it will require major social and cultural changes as most of the threats are related to long-standing beliefs (witchcraft and persecution) or practices (poisoning predators). The poisoning menace needs to be addressed by individual governments as this is a serious issue not just for wildlife, but also for the environment including humans ([Otieno et al. 2010a, 2010b](#)). Highly toxic pesticides need to be banned if tight government controls and restrictions regarding their use cannot be applied continent-wide and enforced. With regards to illegal trade in this species, it is likely these will never be controlled as even trade in the most high-profile animals (elephants and rhinos) cannot be adequately controlled. Therefore, only the further decline of this species, and hence the difficulty in obtaining it, may limit its trade, particularly for bushmeat. Reducing persecution of this species, and raptors in general, will require a major effort in terms of educating people about the benefits of raptors.

It is apparent from conducting this exercise that there is an urgent need to do large-scale, long-term monitoring of Hooded and other vulture species, and raptors in general, throughout the continent. Ideally, this should be on at least a countrywide scale and repeated at least every five years given the speed at which declines may be occurring.

Although the overall situation for the conservation of Hooded Vultures is not good, there are some countries (e.g. Ethiopia and Guinea) that still have significant populations of these birds and studies to identify causes of mortality and population dynamics should be undertaken in these countries as soon as possible.

There exists a lack of local capacity to conduct raptor studies in Africa. As raptors are charismatic birds, a lot of knowledge on raptor populations could be gained through 'citizen science', but Africa in particular lacks the capacity to train and encourage this type of science that is becoming prevalent in other parts of the world. There needs to be a greater effort to encourage and train more local people to study raptors. As raptors are a particularly difficult group of birds to identify, mentoring of young raptorphiles requires a large amount of training to become proficient and this will only happen as a result of the efforts of dedicated individuals.

Acknowledgements — The compilation of this report is as a result of many individual contributions from raptor conservationists. James Wolstencroft initiated online discussions that were the genesis

of this report. We thank the following people for their contributions: Bernhard Ahon, Neil Baker, Wouter Bol, Andre Botha, Joost Brouwer, Marcell Claassen, Callan Cohen, Mary Crickmore, Yilma Dellelegn, Tom Ewert, David Fisher, Falk Grossman, Pete Hancock, Doug Harebottle, Institut de Recherche pour le Développement, Karim Kara, James Karanja, Chege wa Kariuki, Corinne Kendall, James Kuria, Johannes and Sharon Merz, Bachirou Mohamadou, Wim Mullié, Campbell Murn, Mordecai Ogada, Derek Pomeroy, Fiona Reid, Paul Robinson, Rob Simmons, Simon Thomsett, Peter Usher, Munir Virani, Peter Weesie, Malcolm Wilson and James Wolstencroft. We are particularly grateful to Françoise Lemaire and Bob Dowsett for their extensive contributions to the manuscript. George Aike assisted with preparation of the map. David Houston and one anonymous reviewer provided helpful comments that improved an earlier draft of this manuscript.

References

- African Bird Club, Dowsett B. 2007–2010. Country checklists. Available at <http://www.africanbirdclub.org/countries/checklists/index.html> [accessed on 13 July 2010].
- Anderson MD. 1990. Hooded Vulture. In: Barnes KN (ed.), *The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland*. Johannesburg: Birdlife South Africa. pp 71–72.
- Anderson MD. 1999. Africa's Hooded Vulture: a dichotomy of lifestyle. *Vulture News* 41: 3–5.
- Anderson DJ, Horwitz RJ. 1979. Competitive interactions among vultures and their avian competitors. *Ibis* 121: 505–509.
- Barnes KN (ed.). 2000. *The Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland*. Johannesburg: BirdLife South Africa.
- Barnes KN, Tarboton, WR. 1998. Important Bird Areas of the Northern province. In: Barnes KN (ed.), *The Important Bird Areas of Southern Africa*. Johannesburg: Birdlife South Africa. pp 47–63.
- BirdLife Botswana. 2008. The status of globally and nationally threatened birds in Botswana 2008. Unpublished report.
- BirdLife International 2009. *Necrosyrtes monachus*. In: IUCN Red List of Threatened Species Version 2010.2. Available at <http://www.iucnredlist.org> [accessed on 22 July 2010].
- BirdLife International 2010. IUCN Red List for birds. Available at <http://www.birdlife.org> [accessed on 16 November 2010].
- Borello W. 2004. Conservation status of vultures in Botswana. In: Monadjem A, Anderson MD, Piper SE, Boshoff AF (eds), *The Vultures of Southern Africa – Quo Vadis?*. Johannesburg: Birds of Prey Working Group. pp 139–143.
- Boshoff AF, Vernon CJ, Brooke RK. 1983. Historical atlas of the diurnal raptors of the Cape Province (Aves: Falconiformes). *Annals of the Cape Province Museum of Natural History* 14: 173–297.
- Bretagnolle F. 1993. An annotated checklist of birds of north-eastern Central African Republic. *Malimbus* 15: 6–16.
- Bridgeford P. 2004. Status of vultures in Namibia. In: Monadjem A, Anderson MD, Piper SE, Boshoff AF (eds), *The Vultures of Southern Africa – Quo Vadis?*. Johannesburg: Birds of Prey Working Group. pp 144–147.
- Brooke RK. 1984. *South African Red Data Book – Birds*. South African National Scientific Programmes Report No. 97. Pretoria: CSIR.
- Brooks T, Thompson HS. 2001. Current bird conservation issues in Africa. *Auk* 118: 575–582.
- Brown L. 1971. *African Birds of Prey*. Boston: Houghton Mifflin.
- Browne PWP. 1980. Birds observed near Lome, Togo in 1976 and 1977. *Malimbus* 2: 51–55.
- Carroll RW. 1988. Birds of the Central African Republic. *Malimbus* 10: 177–200.
- Cheke RA, Walsh JF. 1980. Bird records from the Republic of Togo. *Malimbus* 2: 112–120.
- Claffey PM. 1995. Notes on the avifauna of the Bétérou area, Borgou Province, Republic of Benin. *Malimbus* 17: 63–84.
- Clancey PA. 1971. A handlist of the birds of southern Mozambique. Lourenco Marques: Instituto de Investigacao Cientifica de Mozambique.
- Crick HQP, Marshall PJ. 1981. The birds of Yankari Game Reserve, Nigeria: their abundance and seasonal occurrence. *Malimbus* 3: 103–114.
- Dean WRJ. 2001. The distribution of vultures in Angola. *Vulture News* 45: 20–25.
- Dellelegn Y, Abdu B. 2010. Ethiopian vulture survey report. Unpublished report to the Royal Society for the Protection of Birds.
- Demey R, Fishpool LDC. 1991. Additions and annotations to the avifauna of Côte D'Ivoire. *Malimbus* 12: 61–86.
- Dowsett RJ, Aspinwall DR, Dowsett-Lemaire F. 2008. *The Birds of Zambia*. Liège: Tauraco Press and Aves.
- Dowsett-Lemaire F, Dowsett RJ. 2006. *The Birds of Malawi*. Liège: Tauraco Press and Aves.
- Gee JP. 1984. The birds of Mauritania. *Malimbus* 6: 31–66.
- Giraudoux P, Degauquier R, Jones PJ, Weigel J, Isenmann P. 1988. Avifaune de Niger: état de connaissances en 1986. *Malimbus* 10: 1–140.
- Githiru M, Mwangi JW, Virani MZ, Ndong'ang'a PK. 2009. Draft sub-regional black list for sub-Saharan Africa birds of prey. Unpublished report.
- Green AA, Sayer JA. 1979. The birds of Pendjari and Aéri National Parks (Benin and Upper Volta) *Malimbus* 1: 14–28.
- Gustafsson R, Hjort C, Ottosson U, Hall P. 2003. Birds at Lake Chad and in the Sahel of NE Nigeria 1997–2000. The Lake Chad Bird Migration Project. Special report from Ottenby Bird Observatory, Degerhamn, Sweden.
- Halleux D. 1994. Annotated bird list of Macenta Prefecture, Guinea. *Malimbus* 16: 10–29.
- Hancock P. 2009. Poisons devastate vultures throughout Africa. *African Raptors Newsletter* 2 (November).
- Hancock P. 2010. Vulture poisoning at Khutse. *Birds and People* 27: 7.
- Harding DP, Harding RSO. 1982. A preliminary checklist of the birds in the Kilimi area of northwest Sierra Leone. *Malimbus* 4: 64–68.
- Harebottle D. 2010. Hooded Vulture – range change map shows some concern. Available at <http://www.sabap2.adu.org.za/index.php> [accessed on 10 November 2010].
- Harkrider JR. 1993. Garden and farm-bush birds of Njala, Sierra Leone. *Malimbus* 15: 38–46.
- Hartley RR, Hustler K, Mundy PJ. 1996. Human Impact on Raptors. In: Bird D, Varland D, Negro J (eds), *Raptors in Human Landscapes*. London: Academic Press. pp 337–352.
- Hazevoet CJ. 1996. Birds observed in Guinea-Bissau, January 1986, with a review of current ornithological knowledge. *Malimbus* 18: 10–24.
- Herremans M, Herremans-Tonnoeyr D. 2000. Land use and the conservation status of raptors in Botswana. *Biological Conservation* 94: 31–41.
- IUCN (International Union for Conservation of Nature and Natural Resources). 2001. *IUCN Red List Categories and Criteria: Version 3.1*. Gland: IUCN.
- Kemp AC, Herholdt JJ, Whyte I, Harrison J. 2001. Birds of the two largest parks in South Africa: a method to generate estimates of population size for all species and assess their conservation ecology. *South African Journal of Science* 97: 393–403.
- Long C. 1960. The birds of the Port Herald District. *Ostrich* 31: 85–104.
- Maphisa D. 2001. British Schools Exploration Society's (BSES) survey of vultures at selected sites in Lesotho—July to August 1998. *Vulture News* 45: 11–19.
- Mundy P, Butchart D, Ledger J, Piper S. 1992. *The Vultures of Africa*. London: Academic Press.

- Mundy PJ. 1997. Hooded Vulture *Necrosyrtes monarchus*. In: Harrison JA, Allan DG, Underhill LG, Herremans M, Tree AJ, Parker V, Brown CJ (eds), *The Atlas of Southern African Birds, Vol. 1: Non-passerines*. Johannesburg: BirdLife South Africa. pp 156–157.
- Mundy PJ. 2000. More on the Hooded Vultures in Ghana. *Vulture News* 43: 64.
- Nikolaus G. 2001. Bird exploitation for traditional medicine in Nigeria. *Malimbus* 23: 45–55.
- Newby J. 1979. The birds of Ouadi Rimé-Ouadi Achim Faunal Reserve. A contribution to the study of the Chadian avifauna. *Malimbus* 1: 90–109.
- Njilima F, Kyonjola N, Wolstencroft J. 2010. Tanzania vultures baseline survey report. Unpublished report to the Royal Society for the Protection of Birds.
- Ogada DL, Keesing F. 2010. Decline of raptors over a three-year period in Laikipia, central Kenya. *Journal of Raptor Research* 44: 129–135.
- Ogada DL, Thomsett S, Virani MZ, Kendall C, Odino M. 2010. Raptor road counts in Kenya: with emphasis on vultures. Unpublished report to the Royal Society for the Protection of Birds.
- Otieno PO, Lalah JO, Virani M, Jondiko IO, Schramm KW. 2010a. Soil and water contamination with carbofuran residues in agricultural farmlands in Kenya following Furadan application. *Journal of Environmental Science and Health Part B* 45: 137–144.
- Otieno PO, Lalah JO, Virani M, Jondiko IO, Schramm K-W. 2010b. Carbofuran and its toxic metabolites provide forensic evidence for Furadan exposure in vultures (*Gyps africanus*) in Kenya. *Bulletin of Environmental Contamination and Toxicology*. 84: 536–544.
- Parker V. 1999. *The Atlas of the Birds of Sul do Save, Southern Mozambique*. Cape Town: Avian Demography Unit, University of Cape Town; Johannesburg: Endangered Wildlife Trust.
- Parker V. 2004. The status of vultures in Mozambique. In: Monadjem A, Anderson MD, Piper SE, Boshoff AF (eds), *The Vultures of Southern Africa – Quo Vadis?*. Johannesburg: Birds of Prey Working Group. pp 137–138.
- Petrides GA. 1959. Competition for food between five species of East African vultures. *Auk* 76: 104–106.
- Pomeroy D. 2010. Road counts of raptors: Uganda 2010. Unpublished report to the Royal Society for the Protection of Birds.
- Rainey H, Lachenaud O. 2002. Recent bird observations from Ivory Coast. *Malimbus* 24: 23–37.
- Richards DK. 1982. The birds of Conakry and Kakulima, Democratic Republic of Guinea. *Malimbus* 4: 93–104.
- Roche C. 2006. Breeding records and nest site preference of Hooded Vultures in the greater Kruger National Park. *Ostrich* 77: 99–101.
- Rodwell SP, Sauvage A, Rumsey SJR, Braunlich A. 1996. An annotated check-list of the birds occurring at Parc National des Oiseaux du Djoudj in Senegal, 1984–1994. *Malimbus* 18: 74–111.
- Rondeau G, Condeé MM, Ahon B, Diallo O, Pouakouyou D. 2008. Survey of the occurrence and relative abundance of raptors in Guinea subject to international trade. *JNCC Report* no. 412. Peterborough: Joint Nature Conservation Committee.
- Rondeau G, Thiollay JM. 2004. West African vulture decline. *Vulture News* 51: 13–33.
- Salewski V. 2000. The birds of Comoé National Park, Ivory Coast. *Malimbus* 22: 55–76.
- Scholte P. 1998. Status of vultures in the Lake Chad Basin, with special reference to Northern Cameroon and Western Chad. *Vulture News* 39: 3–19.
- Sekercioglu CH. 2004. Increasing awareness of avian ecological function. *Trends in Ecology and Evolution* 21: 464–471.
- Simmons RE, Brown CJ. In press. *Birds to Watch in Namibia: Red, Rare and Endemic Species*. Windhoek: National Biodiversity Programme.
- Sodeinde SO, Soewu DA. 1999. Pilot study of the traditional medicine trade in Nigeria. *Traffic Bulletin* 18: 35–40.
- Ssemmanda R, Pomeroy D. 2010. Scavenging birds in Kampala since 1973. *Scopus* 30: 26–31.
- Tarboton WR, Allan DG. 1984. *The Status and Conservation of Birds of Prey in the Transvaal*. Transvaal Museum Monograph no. 3. Pretoria: Transvaal Museum.
- Thiollay JM. 1977. Importance des populations de rapaces migrateurs en méditerranée occidentale. *Alauda* 45: 115–121.
- Thiollay JM. 2001. Long-term changes of raptor populations in northern Cameroon. *Journal of Raptor Research* 35: 173–186.
- Thiollay JM. 2006a. The decline of raptors in West Africa: long-term assessment and the role of protected areas. *Ibis* 148: 240–254.
- Thiollay JM. 2006b. Large bird declines with increasing human pressure in savanna woodlands (Burkina Faso). *Biodiversity and Conservation* 15: 2085–2108.
- Thiollay JM. 2007a. Raptor population decline in West Africa. *Ostrich* 78: 405–413.
- Thiollay JM. 2007b. Raptor declines in West Africa: comparisons between protected, buffer and cultivated areas. *Oryx* 41: 322–329.
- Verdoorn GH, van Zijl N, Snow TV, Komen L, Marais EW. 2004. Vulture poisoning in southern Africa. In: Monadjem A, Anderson MD, Piper SE, Boshoff AF (eds), *The Vultures of Southern Africa – Quo Vadis?*. Johannesburg: Birds of Prey Working Group. pp 195–201.
- Virani MZ, Kendall CJ, Njoroge P, Thomsett S. 2011. Major declines in the abundance of some avian scavengers in and around the Masai Mara ecosystem, Kenya. *Biological Conservation* 144: 746–752.
- Vogeley W. 2004. Status of vultures in Quthing District, southern Lesotho. In: Monadjem A, Anderson MD, Piper SE, Boshoff AF (eds), *The Vultures of Southern Africa – Quo Vadis?*. Johannesburg: Birds of Prey Working Group. pp 129–131.
- Walsh JF. 1987. Records of birds seen in north-eastern Guinea in 1984–1985. *Malimbus* 9: 105–122.
- Wilson RT. 1982. Environmental changes in Western Darfur, Sudan, over half a century and their effects on selected bird species. *Malimbus* 4: 15–26.
- Wright BS. 1960. Predation on big game in East Africa. *Journal of Wildlife Management* 24: 1–15.
- Zimmerman DA, Turner DA, Pearson DJ. 1996. *Birds of Kenya and Northern Tanzania*. London: Christopher Helm.